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1: J Am Geriatr Soc 2002 Feb;50(2):349-53 [Related Articles, Links](#)

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Exercise-induced oxidative stress in older adults as a function of habitual activity level.

Meijer EP, Goris AH, van Dongen JL, Bast A, Westerterp KR.

Department of Human Biology, Maastricht University, The Netherlands.

OBJECTIVES: It has been suggested that regular physical activity might maintain and promote the antioxidant defense capacity against oxidative stress. Therefore, we assessed exercise-induced oxidative stress in relation to habitual physical activity level (PAL) in older adults.

DESIGN: The study included a 2-week observation period for the measurement of average daily metabolic rate (ADMR) and PAL.

Exercise-induced oxidative stress was measured during a 45-minute cycling test at submaximal intensity. SETTING: A university medical research center.

PARTICIPANTS: Twenty-six subjects volunteered for the study ($n = 26$; mean age \pm standard deviation 60 ± 1 ; body mass index 27 ± 1 kg/m²).

MEASUREMENTS: PAL was determined as ADMR combined with a measurement of basal metabolic rate (BMR): $PAL = ADMR/BMR$. ADMR was measured over 2 weeks with the doubly labeled water method, preceded by a BMR measurement with a ventilated hood. Antipyrine oxidation was used as marker for oxidative stress in vivo. Reaction of antipyrine with hydroxyl radicals results in the formation of para-hydroxyantipyrine (p-APOH) and ortho-hydroxyantipyrine (o-APOH), where o-APOH is not formed through alternative oxygenetic pathways.

RESULTS: PAL was inversely related to the exercise-induced increase in the ratio of o-APOH to native antipyrine ($r = 0.49$, $P = .010$). The relationship between PAL and exercise-induced increase in the ratio of p-APOH ($r = 0.30$, $P = .140$) or thiobarbituric acid reactive species ($r = 0.31$, $P = .130$) did not reach the level of significance.

CONCLUSION: Physically active older adults have a reduced exercise-induced oxidative stress than older adults with a lower level of physical activity. It seems that regular physical activity improves the antioxidant defense capacity.